

REMARKS

Status of the Claims

Claims 1-2 and 4-17 are pending. Claims 1-2 and 4-17 are rejected. Claims 1 and 4-17 are amended herein. Claim 11 is canceled. New claims 25-33 are added. No new matter was incorporated.

Applicants' invention

With regard to Applicants' independent claim 1, as amended the invention is directed to a substrate processing system comprising a cassette load station, a centrally located transfer chamber, a load lock chamber located between the cassette load station and the transfer chamber and at least one process chamber around the periphery of the transfer chamber. As amended, the load lock chamber comprises two stationary load locks each with stationary dual slots for holding a substrate. The load locks are constructed in a stacked configuration (pg. 7, ll. 19-26; Fig. 1-3). Each load lock comprises a heating plate and a cooling plate, each of which is located in a different slot (pg. 12, ll. 6-7).

Claims 4-10 and 12-17 depend from claim 1 and are amended as shown supra. Amendments to dependent claims 4-11 are to clarify claim language and/or to correct grammar. Claims 6 and 9 are amended to clarify that the heating plate heats the substrate and that the cooling plate cools the substrate, respectively (pg. 9, ll. 16-17 and pg. 10, ll. 28-29). Claim 10 is amended to clarify that cooling is done by water or cooling is done by nitrogen gas or nitrogen gas mixed with helium (pg. 10, ll. 2-3). Claim 11 is canceled. Claims 12-17 are amended to simplify claim language by eliminating repetitive phrases and/or to correct grammar.

Applicants have added new claims 25-33. Claim 25 differs from claim 1 in that the recitation of heating/cooling plates in claim 1 have been deleted and incorporated into dependent claim 26. Claims 27-33 correspond to claims 4-5, 7-8 and 12-17, as amended, and contain no new matter. The specification teaches that the upper slots in the load lock optionally may have a heating plate (pg. 9, ll. 16-17) and that the lower slots optionally may have a cooling plate (pg. 10, ll. 28-29).

The U.S.C. §103(a) Rejections

Claims 1-2 and 4-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over **Hofmeister** (U.S. 6,318,945) in view of **White et al.** (U.S. 6,086,362). Claims 14-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over **Hofmeister** in view of **White et al.** as applied to claims 1-2 and 4-13 and further in view of **Iwai et al.** Claim 17 is rejected under 35 U.S.C. §103(a) as being unpatentable over **Hofmeister** in view of **White et al.** as applied to claims 1-2 and 4-13 and further in view of **Maydan et al.** (U.S. 5,224,809). These rejections are respectfully traversed.

Hofmeister and White et al. as applied to claims 1 and 4-13

As applied in the 35 U.S.C. 102(e) rejection mailed December 13, 2001, the Examiner states that **Hofmeister** shows the invention as claimed including a load lock chamber with a double dual slot load lock constructed at a same location for a multi-chamber apparatus (Figs. 2-3; col. 2, ll. 62 - col. 3, ll. 57), but fails to expressly disclose a heating plate and a cooling plate located in different slots of the loadlock chamber. Further, **White et al.**

disclose a loadlock chamber which includes both heating plates and cooling plates (Abstract). Thus, one of ordinary skill in the art would modify the apparatus of Hofmeister so as to include heating plates and cooling plates in different slots because the presence of both heating plates and cooling plates in all of the slots in the loadlock chamber allows for more flexibility in the process.

With regard to amended independent claim 1, Hofmeister discloses a substrate transport and load lock assembly built at one location as a single unit which contains stacked isolated areas. The top and bottom areas function as moving load locks and are isolated from the middle area and from each other only by the movement and subsequent location of the sealing plates on the substrate supports when the load locks are moved into position by the elevator (Fig. 3, col. 3, lines 48-50; col. 4, lines 32-47). White et al. teach a glass substrate processing system which comprises a load lock having either a removable heating assembly to raise and heat a substrate (col. 3, ll. 7-14) or, when used to cool a substrate, a removable cooling assembly instead of the removable heating assembly (col. 3, ll. 41-49).

As amended, claim 1 recites a load lock chamber comprising two stationary load locks each comprising stationary dual slots for holding a substrate constructed in a stacked configuration, i.e., at the same location (pg. 7, ll. 19 to pg. 8, ll. 13, Figs. 3-6). The load locks comprise a heating plate and a cooling plate each in different slots. (pg. 12, ll. 6-14, Figs. 4-5). **Hofmeister** neither teaches nor suggests stationary load locks nor stationary dual slots.

In combining **White et al.** with **Hofmeister et al.**, these prior art references must teach the elements of the instant invention as claimed together with a suggestion or motivation for one of ordinary skill in the art to make the combination. Even, *arguendo*, if the load locks in **Hofmeister et al.** are modified by installing a heating assembly and a cooling assembly within each substrate support elevator, **Hofmeister** still would not teach nor suggest stationary load locks nor stationary dual slots in the load locks. Both load locks in **Hofmeister** must be raised and lowered to operate and the substrates placed or removed from the load locks via removable substrate support cassettes (col. 3, ll. 58 to col. 4, ll. 51).

Claims 2 and 4-13 depend directly or indirectly from independent claim 1 and are allowable for the reasons stated *supra*,

as well as for their respective attributes. Thus, as **Hofmeister** in combination with **White et al.** does not render the instant invention as recited in amended claim 1 obvious, the incorporation of any of the limitations of dependent claims 2 and 4-13 into amended claim 1 also does not render the instant invention obvious.

In view of the above claim amendments and remarks, Applicants respectfully submit that obviousness is not established by **Hofmeister** in combination with **White et al.** Accordingly, Applicants respectfully request that the rejection of claims 1-2 and 4-13 under 35 U.S.C. §103(a) be withdrawn.

Hofmeister with White et al. and Iwai et al. as applied to claims 14-16

The Examiner states that **Hofmeister** and **White et al.** do not expressly disclose flip type valves or doors being used between the load lock and transfer chambers. **Iwai et al.** teach using a flip type door that securely closes a chamber through which a number of semiconductor wafers are placed (Fig. 25, col. 33, line 65 to col. 34, line 23). Furthermore, in the art, flip-type doors can be replaced with flip-type slit valves. Applicants' invention with respect to claims

14-16, **Hofmeister** and **White et al.** are as Applicants described *supra*.

Claims 14-16 depend directly or indirectly from independent claim 1 and are allowable for the reasons stated *supra* in considering dependent claims 2 and 4-13, as well as for their respective attributes. Thus, as **Hofmeister** in combination with **White et al.** do not render the instant invention as recited in claims 1-2 and 4-13 obvious, then **Iwai et al.** in further combination with **Hofmeister** and **White et al.**, do not render the instant invention obvious. Accordingly, Applicants respectfully request that the rejection of claims 14-16 under 35 U.S.C. §103(a) be withdrawn.

Hofmeister with White et al. and Maydan et al. as applied to claim 17

Hofmeister and **White et al.** do not expressly disclose having a filter system in the load lock chamber. **Maydan et al.** discloses a filtering system that is used to remove particulates from the load lock chamber (col. 13, line 61-col. 15, line 35). Applicants' invention with respect to claim 17, **Hofmeister** and **White et al.** are as Applicants described *supra*.

Claim 17 depends directly from independent claim 1 and is allowable for the reasons stated *supra* in considering dependent claims 2 and 4-13, as well as for its own attributes. Thus, as **Hofmeister** in combination with **White et al.** does not render the instant invention as recited in claims 1-2 and 4-13 obvious, then **Maydan et al.** in further combination with **Hofmeister/White et al.** do not render the instant invention obvious. Accordingly, Applicants respectfully request that the rejection of claim 17 under 35 U.S.C. §103(a) be withdrawn.

This is intended to be a complete response to the Final Office Action mailed March 5, 2003. If any issues remain outstanding, the Examiner is respectfully requested to telephone the undersigned attorney of record for immediate resolution. Applicants include a Petition for a One Month Extension of Time. Please debit the \$110 petition fee under 37 C.F.R. 1.17(a), or any additional fees due, from Deposit Account No. 07-1185 on which the undersigned is allowed to draw.